

WHAT IS CLAIMED IS:

1. A power output apparatus comprising:
an engine including a combustion chamber;
5 a fuel supply device for supplying fuel into the combustion chamber;
an exhaust gas purification device for purifying gas emitted from the combustion chamber by a catalyst; and
a control device for controlling said fuel supply device to
10 perform a fuel supply stop process of stopping supply of the fuel after performing a fuel increase process of increasing an amount of the fuel in the combustion chamber from that at a present state, as a control for preventing deterioration of the catalyst upon stopping said engine.
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2. The power output apparatus according to claim 1, wherein said control device controls said fuel supply device such that a start time point of the fuel supply stop process coincides with a start time point of a process of stopping said engine.
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3. The power output apparatus according to claim 1, wherein said control device controls said fuel supply device to perform the fuel increase process depending on a temperature of the catalyst.
- 25 4. The power output apparatus according to claim 3, wherein said control device controls said fuel supply device to perform the

fuel increase process if the temperature of the catalyst is above a predetermined temperature threshold value.

5. The power output apparatus according to claim 1, wherein
5 said control device controls said fuel supply device such that a start time point of the fuel supply stop process is after passing two to three seconds from a start time point of the fuel increase process.

6. A power output apparatus comprising:
10 an engine including a combustion chamber;
a fuel supply device for supplying fuel into the combustion chamber;
an exhaust gas purification device for purifying gas emitted from the combustion chamber by a catalyst; and
15 a control device for controlling said fuel supply device to perform a fuel supply stop process of stopping supply of the fuel to the combustion chamber depending on a temperature of the catalyst and engine revolutions of said engine, as a control for preventing deterioration of the catalyst upon stopping said engine.

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7. The power output apparatus according to claim 6, wherein said control device controls said fuel supply device to perform the fuel increase process if the engine revolutions are below a predetermined engine revolutions threshold value.

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8. The power output apparatus according to claim 6, wherein

said control device controls said fuel supply device to perform the fuel supply stop process after performing a fuel increase process of increasing an amount of the fuel in the combustion chamber from that at a present state, upon stopping said engine.

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9. A power output apparatus comprising:

an engine including a combustion chamber;

a fuel supply device for supplying fuel into the combustion chamber;

10 an exhaust gas purification device for purifying gas emitted from the combustion chamber by a catalyst; and

a control device for controlling at least said fuel supply device such that a ratio of fuel in an atmosphere around the catalyst is greater than a ratio of air in the atmosphere, as a control for preventing deterioration of the catalyst upon stopping said engine.

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10. A power output apparatus comprising:

an engine including a combustion chamber;

20 a fuel supply device for supplying fuel into the combustion chamber;

an exhaust gas purification device for purifying gas emitted from the combustion chamber by a catalyst;

an air amount adjustment device for adjusting an air amount flowed into the catalyst; and

25 a control device for controlling said fuel supply device to perform a fuel supply stop process of stopping supply of the fuel and

for controlling said air amount adjustment device to reduce the air amount flowed into the catalyst, if temperature of the catalyst is above a predetermined temperature threshold value as a control for preventing deterioration of the catalyst upon stopping said engine.

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11. The power output apparatus according to claim 10, wherein said control device controls said fuel supply device to perform the fuel supply stop process after performing a fuel increase process of increasing an amount of the fuel in the combustion chamber from
10 that at a present state.

12. A power output apparatus comprising:
an engine including a combustion chamber;
a fuel supply device for supplying fuel into the combustion
15 chamber;
an exhaust gas purification device for purifying gas emitted from the combustion chamber by a catalyst;
an air amount adjustment device for adjusting an air amount flowed into the catalyst; and
20 a control device for controlling said fuel supply device to perform a fuel supply stop process of stopping supply of the fuel after performing a fuel increase process of increasing an amount of the fuel in the combustion chamber from that at a present state and for controlling said air amount adjustment device to reduce the air
25 amount flowed into the catalyst, as a control for preventing deterioration of the catalyst upon stopping said engine.

13. The power output apparatus according to claim 1, further comprising:

an oxygen concentration sensor for measuring or estimating
5 the concentration of oxygen in an exhaust system in an upstream of the catalyst; and

an air/fuel ratio memory device for memorizing an air/fuel ratio in the exhaust system when said engine is stopped,

said control device controlling said fuel supply device to
10 correct a fuel increasing amount in the fuel increase process by feedback-learning such an air/fuel ratio at a previous or past stop time of said engine that is memorized by said air/fuel ratio memory device.

15 14. The power output apparatus according to claim 13, further comprising an announcement device for announcing to a driver if a fuel increasing amount in the fuel increase process is greater than a predetermined upper value or less than a predetermined lower value.

20 15. A hybrid power output apparatus comprising:

an engine including a combustion chamber;

a fuel supply device for supplying fuel into the combustion chamber;

an exhaust gas purification device for purifying gas emitted
25 from the combustion chamber by a catalyst;

a control device for controlling said fuel supply device to

perform a fuel supply stop process of stopping supply of the fuel after performing a fuel increase process of increasing an amount of the fuel in the combustion chamber from that at a present state, as a control for preventing deterioration of the catalyst upon stopping said engine; and

a motor generator apparatus which can generate electric power by using at least one portion of an output of said engine and which can output a driving force through a drive shaft.

10 16. The hybrid power output apparatus according to claim 15, wherein

said engine performs an intermittent operation, and

a stop time point of said engine includes a transition time point from an operating period to a down period in the intermittent operation.

17. A method of controlling an engine which includes a combustion chamber, comprising:

a fuel increase process of increasing an amount of fuel in the combustion chamber from that at a present state upon stopping the engine; and

a fuel supply stop process of stopping supply of the fuel after said fuel increase process upon stopping the engine.

25 18. A method of controlling an engine which includes a combustion chamber, comprising a fuel supply stop process of

stopping supply of fuel to the combustion chamber, depending on a temperature of a catalyst for purification of gas emitted from the combustion chamber and engine revolutions of the engine, upon stopping the engine.

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19. A method of controlling an engine which includes a combustion chamber, comprising: a process of increasing a ratio of fuel in an atmosphere around a catalyst with respect to a ratio of air in the atmosphere upon stopping the engine.

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20. A method of controlling an engine which includes a combustion chamber, comprising:

15 a fuel supply stop process of stopping supply of fuel upon stopping the engine if a temperature of a catalyst is above a predetermined temperature threshold value; and

a process of decreasing an air amount flowed into the catalyst along with said fuel supply stop process.

20 21. A method of controlling an engine which includes a combustion chamber, comprising:

a fuel increase process of increasing an amount of fuel in the combustion chamber from that at a present state upon stopping the engine;

25 a fuel supply stop process of stopping supply of the fuel after said fuel increase process; and

a process of decreasing an air amount flowed into a catalyst

along with said fuel supply stop process.

22 A hybrid vehicle comprising:

(i) a hybrid power output apparatus comprising:

5 an engine including a combustion chamber;

a fuel supply device for supplying fuel into the combustion chamber;

an exhaust gas purification device for purifying gas emitted from the combustion chamber by a catalyst;

10 a control device for controlling said fuel supply device to perform a fuel supply stop process of stopping supply of the fuel after performing a fuel increase process of increasing an amount of the fuel in the combustion chamber from that at a present state, as a control for preventing deterioration of the catalyst upon stopping said
15 engine; and

a motor generator apparatus which can generate electric power by using at least one portion of an output of said engine and which can output a driving force through a drive shaft,

(ii) a vehicle main body on which said hybrid power output
20 apparatus is mounted; and

(iii) wheels mounted on said vehicle main body and driven by a driving force outputted through the drive shaft.